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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,944	02/15/2002	Richard Lauder	47914/DBP/C664	3417
23363	7590	01/12/2005		
CHRISTIE, PARKER & HALE, LLP PO BOX 7068 PASADENA, CA 91109-7068			EXAMINER WANG, QUAN ZHEN	
			ART UNIT 2633	PAPER NUMBER

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/076,944	Applicant(s) LAUDER ET AL.	
	Examiner Quan-Zhen Wang	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. How the elements are selected to provide channels that are "substantially balanced" is not disclosed and appears critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). There is no teaching of how the applicants provide this function, just that is done. Since the specification does not teach how the balancing is done, the disclosure fails to enable a person skilled in the art to make and use the claimed inventions as recited in claims 1-23.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 1-23 provide for the use of two modules that are substantially balanced, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-23 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4, 6-8, 10-11, 13, 16, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al. (U.S. Patent US 5,923,450) and in view of Dickson (U.S. Patent US 6,750,995 B2).

Regarding claims 1 and 13, as they are understood in view of the above 101 and 112 problems, Dugan teaches a WDM system (fig. 1) comprising: a first WDM module (fig. 1, 12, 16, and 18) having a first multiplexer unit (fig. 1, 18) for multiplexing a WDM optical signal, a second WDM module (fig. 1, 26, 28, and 32) having a first demultiplexer unit (fig. 1, 26) for demultiplexing the WDM optical signal, and wherein the system is arranged such that optical losses experienced by individual channels of the WDM optical signal in the first multiplexing unit and the first demultiplexing unit and optical losses experienced by the channels between the first and second WDM modules are balanced (column 1, lines 35-38; column 3, lines 34-40). Dugan differs from the claimed invention in that Dugan does not specifically teach that the loss balancing is during un-amplified transmission between the first and second WDM modules.

However, Dickson teaches an optical communication system (fig. 1) with un-amplified transmission between the first (fig. 1, MUX) and second (fig. 1, DEMUX) WDM modules. In addition, Dugan further teaches that the number of optical amplifiers in Dugan's WDM system dependent upon a number of factors, including the length of the transmission fiber (column 3, lines 23-25). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to transmit the signals between WDM modules without amplification if the length of transmission fiber is not long enough to cause signal degradation in the receivers, as it is taught by Dickson, and balance the

optical losses during un-amplified transmission between the first and second WDM modules in the system, as it is taught by Dugan. One of ordinary skill in the art at the time when the invention was made is motivated to remove the optical amplifiers in order to simplify the WDM system and cut down the unnecessary costs for the WDM system.

Regarding claims 4 and 16, Dugan further teaches that the optimum balance at the receive end may be determined by signal-to-noise ratio rather than power level (column 4, lines 38-40).

Regarding claims 6-8, and 18-20, as they are understood in view of the above 101 and 112 problems, it is inherent that the physical design parameters, such as the fiber handling, locations of the ports, and locations of optical components, including filters, affect the insertion loss of the WDM transmission. The optical loss balancing technique for a WDM system taught by Dugan inherently includes balancing the insertion losses caused by the physical design parameters of the WDM module.

Regarding claims 10-11, and 21-22, as they are understood in view of the above 101 and 112 problems, the modified system by Dugan and Dickson differs from the claimed invention in that Dugan and Dickson do not specifically teach that the WDM system is arranged for bi-directional transmission, wherein the first WDM module further comprises a second demultiplexer unit and the second WDM module further comprises a second multiplexer unit, and the system is arranged such that optical losses experienced by individual channels of the WDM optical signal in the second multiplexing unit and the second demultiplexing unit substantially balance optical losses experienced by the channels during un-amplified transmission between the first and second WDM

modules; and the balancing in relation to the first multiplexing unit and the first demultiplexing unit further accounts for the presence of the second multiplexing unit and the second demultiplexing unit and vice versa.

However, a bi-directional WDM system is well known to one of ordinary skill in the art at the time when the invention was made. For example, Dugan discloses a bi-directional WDM system in another embodiment (fig. 4) of the inventions. One of ordinary skill in the art would have been motivated to add a second demultiplexer unit to the first WDM module and a second multiplexer unit to the second WDM module taught by Dugan in order to build a bi-directional transmission system to use a single optical fiber for bi-directional data communications.

Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to arrange the modified system by Dugan and Dickson for bi-directional transmission, and to use the variable optical attenuators to balance the optical losses experienced by individual channel of the WDM optical signal in the second multiplexing unit and the second demultiplexing unit (column 1, lines 35-38; column 3, lines 34-40), and the balancing in relation to the first multiplexing unit and the first demultiplexing unit further accounts for the presence of the second multiplexing unit and the second demultiplexing unit and vice versa in order to equalize the performance of all of the channels.

7. Claims 2 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al. (U.S. Patent US 5,923,450) in view of Dickson (U.S. Patent US 6,750,995

B2) and further in view of Antoniadis et al. (U.S. Patent Application Publication US 2002/0048066 A1).

Regarding claims 2 and 14, as they are understood in view of the above 101 and 112 problems, the modified system by Dugan and Dickson differs from the claimed invention in that Dugan and Dickson do not specifically teach tapping off a management signal from one or more of the channels, and the balancing of the optical losses further accounts for the optical losses caused by the tapping. However, Antoniadis teaches to tap off a management signal from the optical channels (fig. 18, Tap Coupler; Paragraph 0050). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to tap off a management signal, as it is taught by Antoniadis, in the modified system by Dugan and Dickson and balance the optical losses accounting for the optical losses caused by the tapping in order to monitor the WDM system without affecting the data receiving performance of system.

8. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al. (U.S. Patent US 5,923,450) in view of Dickson (U.S. Patent US 6,750,995 B2) and further in view of DeCusatis et al. (Handbook of fiber optic data communication, Academic Press, San Diego, 1998).

Regarding claims 5 and 17, as they are understood in view of the above 101 and 112 problems, the modified system by Dugan and Dickson differs from the claimed invention in that Dugan and Dickson do not specifically teach that the balancing of the optical losses accounts for a nominal 20 km fiber insertion loss. However, the typical

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insertion loss of a single mode fiber is about 0.26 dB/km at 1470 nm and 0.20 dB/km at 1550 nm (DeCusatis et al., fig. 1.13, page 20). Thus, the maximum insertion loss difference in the range from 1470 to 1590 nm for a typical single optical fiber of 20 Km, according to DeCusatis, is about 1.2 dB, which is within the variation range of a typical variable attenuator. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to balance the optical losses accounts for a nominal 20 km fiber insertion loss since the maximum insertion loss difference, according to Decusatis, is within the variation range of a typical variable optical attenuator.

9. Claims 9, 12, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al. (U.S. Patent US 5,923,450) in view of Dickson (U.S. Patent US 6,750,995 B2) and further in view of Jeong (U.S. Patent Application Publication US 2002/0181046 A1).

Regarding claim 9, as it is understood in view of the above 101 and 112 problems, the modified system by Dugan and Dickson differs from the claimed invention in that Dugan and Dickson do not specifically teach that the first multiplexer unit and the first demultiplexer unit each comprises a plurality of filter elements, and an order of the filter elements in the optical path of the WDM signal is chosen to facilitate the balancing of the optical losses. However, Jeong teaches a multiplexer/demultiplexer unit comprising a plurality of filter elements (fig. 2). Jeong further teaches that the order of the filters can be altered (paragraph 0019, lines 16-22). Therefore, it would have been

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obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a filter based multiplexer/demultiplexer unit, such as the one taught by Jeong, into the modified WDM system taught by Dugan and Dickson, and choose the order of the filters based on their insertion losses to minimize the differences of the insertion losses between channels, in order to build a more robust WDM multiplexer/demultiplexer architecture with reduced cost for the WDM multiplexer/demultiplexer.

Regarding claims 12 and 23, as they are understood in view of the above 101 and 112 problems, Jeong further teaches that the multiplexer/demultiplexer can be used for Coarse WDM system (paragraph 0020).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Choy et al. (US Patent US 5,825,949) disclose an optical WDM system which enables bidirectional multi-channel data communications at a distance up to 75 km without signal amplification. Li (United States Patent US 6,301,031 B2) disclose a method and apparatus for wavelength-tracking and alignment within an optical communications system, wherein the losses of channels are substantially balanced.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571)

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272-3114. The examiner can normally be reached on 8:30 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw



**HANH PHAN
PRIMARY EXAMINER**